



Illinois Department of Natural Resources

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Pat Quinn, Governor

Marc Miller, Acting Director

October 23, 2009

Ms. Gloria Schleef, Zoning Administrator
Planning and Zoning Office
Iroquois County
1001 E. Grant, Room 107
Watseka, IL 60970

**RE: E.ON Climate & Renewables Sheldon Wind Power Facility, Iroquois County
Endangered Species Consultation Program
EcoCAT Database Reviews #1003208**

Dear Ms. Schleef:

Thank you for submitting this proposed action east of Milford and south of Sheldon for consultation in accordance with the *Illinois Endangered Species Protection Act* [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075. The Department recognizes that this is one of three of the forty recent submissions from the County to EcoCAT related to this project, each representing all or a portion of one square mile in which the project will occur.

As indicated by the accompanying EcoCAT Report, the Department currently has documented records of State-listed endangered or threatened species in the vicinity of or within the provided footprint of this proposal. However, for various reasons, this does not mean other listed species are currently absent from the vicinity, or that they may not occur within the vicinity at some time during the extended life of this activity (>25 years). Moreover, the list of protected species is currently under revision, so that some species which are present may acquire additional legal protection in the near future. The Department's data are far from comprehensive, and land owners in this area are free to alter potential habitats as their needs require, which will affect the incidence of State-listed species.

The proposed activity will occur in the watershed of the Iroquois River (Sugar Creek), which provides essential habitat to several endangered or threatened species of fish and mussels, which are not necessarily limited to the river, but may also ascend tributary streams. Soil erosion associated with construction and long-term operation of wind energy facilities has the potential to adversely affect these species and habitats unless carefully controlled.

In addition, Iroquois County provides important staging areas for migratory birds protected by federal law. Extensive wind energy facilities may adversely affect the ability of such species to arrive on their arctic breeding grounds in good reproductive condition.

An attachment is provided which describes endangered, threatened, and migratory species which may be affected by this proposal and some recommendations to avoid, minimize, or mitigate for potential adverse effects.

The consultation process for this proposal is terminated, unless the County desires additional information or advice related to this proposal.

Should you need additional information regarding the consultation process, or should you have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Keith M. Shank". The signature is fluid and cursive, with the first name "Keith" and last name "Shank" being more prominent than the middle initial "M".

Keith M. Shank
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cc: Joe Borkowski, E.ON Climate and Renewables North America, Inc.
D. Lynn Gresock, ARCADIS US, Inc.

Attachment

Attachment

E.ON Sheldon Wind Energy Facility Sheldon Area, Iroquois County

Wildlife Impact Recommendations

Iroquois County may wish to consider permit conditions requiring the applicant to monitor, assess, and report possible fish and wildlife effects of the proposed action in the following ways.

- § Incorporate best management practices to minimize risk to federally-listed and state-listed species, as outlined in this Attachment. Focus should be on appropriate avoidance and minimization of habitat disturbance, with mitigation measures implemented as applicable.
- § Where feasible, permanent engineering solutions to soil erosion and water quality issues should be required and maintained, particularly with reference to service and access roads.
- § Perform pre-construction assessments of avian and bat usage within the project area. Such assessments should include inventories of habitat types in and near the project area, including crop rotations or choices, and observations of both migratory and resident bird usage. Consideration of all seasons should be included, although spring migration is anticipated to be of greatest interest. Acoustic bat activity monitoring is also appropriate, particularly during the fall migratory season when activity would be expected to be highest. Specific federally-listed and state-listed species of interest are discussed in the following narrative. Risks to protected species should be evaluated and appropriate regulatory permits sought for potential incidental taking of protected animals.
- § Perform at least one year of post-construction monitoring and assessment, noting any changes in wildlife usage patterns and evaluating potential causes of such changes.
- § Consideration should be given to periodic repetition of the post-construction wildlife surveys during the life of the project.

Discussions supporting these recommendations and describing high-value natural resources in the vicinity, or which may occur in the vicinity, and their possible relationship to a wind energy facility, are provided below.

Coal Resources

Iroquois County has no significant coal resources, and there has been no record of any underground coal mining in the County. Hence, past mining will not affect the geological stability of wind turbine foundations.

Iroquois River

This project area is drained by headwater streams which are part of the Iroquois River system (Sugar Creek, Mud Creek, Coon Creek, Possum Trot Ditch, and Eastburn Hollow Creek). The Iroquois River supports several State-listed endangered or threatened species of fish and mussels, including the Weed Shiner, the Ironcolor Shiner, the River Redhorse, the Starhead Topminnow, the Slippershell Mussel, the Black Sandshell Mussel, the Spike Mussel, and the Purple Wartyback Mussel. The Slippershell Mussel and the smaller fishes, in particular, may not be limited to larger streams and may be found in small tributaries. In addition, tributary creeks play a major role in sustaining large populations of sport fish. Many of these creeks are themselves listed as Illinois Natural Areas Inventory Sites because they support highly-diverse populations of ten or more species of listed and non-listed mussels.

Because both fish and mussels require relatively clean sand, gravel, and cobble substrates, siltation and sedimentation resulting from construction or poor engineering practices pose a threat of degradation or loss of habitat. While measures to control short-term erosion are well-understood, it is also essential to provide adequate engineering to assure the stability of long-term structures such as access and service roads.

Kankakee, Beaverville & Southern RR Prairie Natural Heritage Landmark/INAI Site

This railroad prairie extends in a virtually unbroken line from Sheldon to Beaverville, parallel to U.S. Route 52. It does not continue south of U.S. 24, and should not be adversely affected by construction south of that highway.

Wind turbines constructed as part of the proposed action will be readily visible from within the Landmark. However, existing wind turbines in Indiana are already visible from these vantage points, and turbines south of Sheldon should be no more obtrusive than those already present. Nor will turbines associated with this effort be audible within the Landmark. It is the Department's opinion the Landmark is unlikely to be adversely modified by the proposed action.

Iroquois County State Fish & Wildlife Area Complex

The Iroquois County SFWA, located fifteen miles north of the project area, is an ecologically-rich area, supporting dozens of species of State-listed plants and animals, with a number of INAI Sites, Land & Water Reserves (LWR), and Nature Preserves (NP) within it and nearby. These include: **Little Beaver Creek INAI Site, Hooper Branch**

Savanna INAI Site; Leesville Savanna INAI Site, Iroquois County Conservation Area INAI Site, the Hooper Branch Savanna NP, the Carl N. Becker NP, the Iroquois Sands LWR, and the Iroquois County SFWA LWR.

At fifteen miles, the wind turbines associated with this project might barely be visible to a keen-eyed observer under optimal atmospheric conditions, during the day. Aviation warning lights on the turbines are more likely to be visible from these areas, but these areas are generally closed to the public after dark, and the lights are not expected have any influence on wildlife at such a distance.

Bonnie's Prairie Nature Preserve; Watseka Sand Pond INAI Site

This 13-acre Nature Preserve and the larger adjacent INAI Site lie just over six miles northwest of the project area. They support a population of the State-listed threatened Bristly Blackberry. However, they lie on the far side of the Iroquois River from the wind energy development area, and it is very likely that no turbines will be visible to anyone from within either the Nature Preserve or INAI site.

Watsaka Railroad Prairie INAI Site

This narrow linear INAI site lies between the railroad and US Highway 24 just east of their intersections with Route 1 on the east side of Watseka. It was designated because it provides essential habitat for the State-listed endangered **Pink Milkwort, *Polygala incarnata***.

Though the wind project will approach within three miles, it will not directly affect the INAI Site, and intervening vegetation (fencerows) are likely to screen the turbines, even at night.

Documented Listed Species

Franklin's Ground Squirrel, *Spermophilus franklinii*

The State-listed threatened Franklin's Ground Squirrel has been observed along U.S. Route 24 in Newton County, IN within a mile east of Effner, IL. This animal has also been recorded along railroads east of Hoopeston, IL. It is probable this species is present along the railroad and highway prairies within the project area, including but not limited to the Kankakee, Beaverville & Southern RR Prairie Natural Heritage Landmark.

A burrowing rodent adapted to prairie/forest margins, it formerly occupied the northern two-thirds of Illinois. In recent decades, this animal has most often been associated with railroads and highways, partly because these features retain habitat similar to natural conditions, and partly because many records of this animal are based on reported road-kills, rather than biological surveys. The railroad corridors through the project area provide potential dispersion corridors for this species, even if it does not permanently occupy them.

The Franklin Ground Squirrel prefers taller vegetation than the Thirteen-Lined Ground Squirrel, and a higher proportion of its diet (almost 50%) consists of animal matter (insects, smaller mammals, birds, and bird eggs). Its most notable ecological characteristic is its extremely long hibernation period, up to seven months. During its active phase, it still spends up to 90% of its time underground. These factors, along with its preferred vegetative cover, render casual detection and observation unlikely, and purposeful detection difficult, without carefully planned trapping efforts.

Wind energy facilities pose risks to this species from incidental destruction of unidentified burrows due to road modification, power line construction, foundation excavation, underground cabling installation, soil compaction, and shadow-flicker on remaining habitat which may alter prey availability or elevate the stress levels of individual animals through mimicking aerial predators.

Avoidance of potential habitat is recommended. If this cannot be accomplished, trapping surveys should be performed at an appropriate season (May/June) to evaluate the presence of this species, and Incidental Take Authorization sought, if the results so indicate.

Weed Shiner, *Notropis texanus*.

This small State-listed endangered fish has been collected as recently as 2005 from Sugar Creek only two miles west of the Indiana State Line. It is common in streams of northeastern Iroquois County. Though it is likely less common in the Sugar Creek watershed than elsewhere, every watercourse within the project area, whether natural or manmade, should be deemed to support this species.

This species favors low-gradient streams and ditches with sand/silt substrates and abundant aquatic vegetation. Water only a few inches deep or wide is sufficient to support this species. Age-class analysis of populations in Iroquois County indicates that spawning may occur throughout summer months and into the fall, since collections often contain contemporary young-of-the-year of distinct developmental stages. Hence, in-stream disturbances of any type have a reasonable probability of destroying egg masses during much of the year.

Wind energy development may adversely affect this species and its essential habitat through siltation and sedimentation related to construction activities, including the modification of roads, culverts, and bridges, and the use of temporary fords and crossings of streams and drainage ditches. Best management practices should be incorporated to minimize risk of impact. If in-stream work may occur, an Incidental Take Authorization should be considered.

Ironcolor Shiner, *Notropis chalybaeus*, and Starhead Topminnow, *Fundulus dispar*.

State-listed endangered Ironcolor Shiners and State-listed threatened Starhead Topminnows are frequently associated with endangered Weed Shiners in Iroquois County. An Ironcolor Shiner was collected in 2000 from Mud Creek upstream of Milford. However, few streams and ditches within the project area have been surveyed or sampled, so that if these species are present they may have gone undetected. Life requirements and threats are similar to those of the Weed Shiner, although each of these species appears to have a more normally restricted spawning period in May or June. Recommendations are similar to those for the Weed Shiner.

Slippershell Mussel, *Alasmodonta viridis*.

A recently-dead State-listed threatened Slippershell Mussel has been collected from Sugar Creek, in approximately the same vicinity as the Weed Shiner collection. This find suggests an extant population of this species exists in the Sugar Creek watershed.

The Slippershell is a small (up to 1.5 inches) headwater species which can survive up to 30 days out of the water in the wet substrate of intermittent streams. Field tiles provide a constant source of cool water and the associated drainage ditches provide many miles of potential habitat. The identified larval host fishes are the Johnny Darter and the Mottled Sculpin, both small fish which ascend spring runs that may not flow year-round.

Wind farm construction may disrupt potential Slippershell habitat through increased siltation and sedimentation, through water pollution resulting from possible spills of fuel or other construction-related chemicals, and through disruption of field tile flows. If streams or drainage ditches are proposed to be altered, potential direct impact to the species or its habitat could occur.

Northern Harrier, *Circus cyaneus*.

The State-listed endangered Northern Harrier is a ground-nesting grassland hawk. It has not been recently documented as nesting from Iroquois County, but is a frequently-observed migrant. A breeding pair was documented some years ago in northern Vermilion County, about sixteen miles to the south. The species has a statewide range.

While many sources indicate the species needs large open areas of habitat, Illinois studies have demonstrated this hawk can use relatively small patches of habitat for successful breeding, especially in the vicinity of larger habitats. Breeding is often associated with wetlands such as marshes, sedge meadows, and wet prairies.

While most hunting activities occur at fairly low altitudes, hunting can expose this bird to collision risk. This species engages in an aerial courtship display which places it at risk of collision with wind turbines. In addition, males feed brooding females, but the food transfer occurs in the air, also creating collision risk. Wind farm construction and operation may alter concentrations of prey species, changing habitat suitability.

This hawk relies heavily on its acute hearing to locate prey, and--if the noise generated by wind turbines interferes with this function (which is not known to be the case)--turbines might adversely affect their ability to hunt near the turbines, reducing available food resources.

If pre-construction surveys indicate use of the project area by migrant Harriers, post-construction surveys should be performed to determine whether the Harrier continues to hunt territories in proximity to turbines.

Potentially-Occurring Listed Species

Ornate Box Turtle, *Terrapene ornata*

The Board has recommended listing the Ornate Box Turtle as "threatened;" this designation is pending the completion of rulemaking, which should be accomplished in 2009.

This terrestrial turtle is usually found in open grassland areas, in contrast to its cousin, the Eastern Box Turtle, which is usually found in woodlands. This turtle hibernates underground from late September through April, so it cannot evade disturbance during that period. Its carapace carries elaborate markings, including a yellow bar along the spine, which distinguishes it from the other species. While it appears to be more common in sandy soils, it is not restricted to them. Specimens were once common in Iroquois County, and the species is believed to persist in significant numbers there.

As with many turtles, road-kill and over-collecting are major causes of decline. In a recent study of a northwestern Illinois population, a significant number of individuals exhibited carapace scarring from farming equipment (discs and harrows), illustrating that this species may frequently be found in rowcrop fields.

Preferred habitat of this species may not be present in the project area, but too little is known of this species' current distribution to rule out its presence. Project workers should be educated as to its appearance and habits, remain alert for turtles on roads and in fields, and report any suspected Ornate Box Turtles to supervisors. The Department of Natural Resources should be promptly notified if any Ornate Box Turtles are identified. Once listed, it will be unlawful to move or capture an Ornate Box Turtle to facilitate the project without first obtaining an Incidental Take Authorization from the Department.

Smooth Softshell Turtle, *Apalone mutica*

The Board has recommended listing the Smooth Softshell as "endangered;" this designation is pending the completion of rulemaking, which should be accomplished in 2009.

This aquatic turtle inhabits larger streams and rivers, in segments with sandy substrates and sand bars. Regarded as a delicacy by many fishermen, this species has suffered from over-collecting, while pollution, siltation, and sedimentation have degraded many habitats. This species may persist in the Kankakee and Iroquois River systems.

Unless transportation of wind turbine components requires the upgrade or reconstruction of bridges, there should be little risk of direct adverse effects to this species. Erosion and siltation pose indirect threats.

Mudpuppy, *Necturus maculosus*

This large (up to one foot) salamander has been recommended by the Board for listing as "threatened;" this designation is pending the completion of rulemaking, which should be accomplished in 2009. At one time, the species had a statewide distribution and may persist in the Iroquois River system.

The Mudpuppy is the only known glochidial host of the State-listed endangered **Salamander Mussel**, *Simpsonia ambigua*, a species which is now being evaluated for federal listing under the Endangered Species Act; the decline of the Mudpuppy may be a major factor in the disappearance of the Salamander Mussel.

The Mudpuppy never develops beyond an aquatic larval stage, and so is never found in terrestrial habitats. It inhabits clear rivers, creeks, streams, lakes, and ponds, but conceals itself under rocks or woody debris during the day, feeding actively at night. It typically goes unseen except by fishermen, who sometimes inadvertently catch it. It can cope with some siltation and sedimentation so long as clear gravelly headwater areas remain available for reproduction. Mating occurs in November, but eggs are not actually fertilized until the following Spring just prior to being attached deposited.

Cool or cold water is essential for this species, which remains active all winter; optimum water temperatures for this species are around 40°F; water temperatures above 72°F are harmful, and those above 77°F can be fatal. Agricultural tile drainage helps lower and maintain stream temperatures, but the removal of riparian trees and shrubs exposes streams to direct solar radiation and heating. In-stream cover provided by rocks and woody debris is essential for concealment and reproduction, since eggs are suspended from the undersides of rocks and logs. The common belief that removal of woody debris from stream channels improves drainage is a factor in the decline of this--and many other-- species.

Major threats include pollution, siltation and sedimentation, stream channelization, and woody debris removal. The main risks associated with wind energy projects will be direct stream modification through the repair or upgrade of roads, modification of aquatic thermal regimes through the disruption of agricultural tile drainage systems, and siltation and sedimentation, which suppress prey populations and render spawning areas unsuitable. Any planned in-stream work may require an Incidental Take Authorization.

Western Hog-Nose Snake, *Heterodon nasicus*

A road-killed neonate Western Hognose Snake was found in September 2009 at the Iroquois County Conservation Area. This represents the first record of this hard-to-see species in Iroquois County since its listing as a protected species. The Conservation Area is located 15 miles north of the proposed project, and on the far side of the Iroquois River, greatly reducing the probability that this species occurs within the project footprint.

However, because this snake is an ambush predator which buries itself in the soil with only its eyes exposed to await its prey (typically toads), it often escapes the notice of the casual observer. Sand prairies near or containing wetlands suitable for amphibian breeding are preferred habitats, and this animal is seldom found in farmed ground.

Black Sandshell Mussel, *Ligumia recta*

A recent record for the Black Sandshell exists for Sugar Creek, just downstream from Milford, and also in the Iroquois River near Iroquois. Consequently the length of Sugar Creek below Milford should be considered to support this species where suitable habitat is present, though this species is less likely to occur in small tributaries. While walleye and sauger are the most successful hosts for this species, most species in the Sunfish and Catfish families can also host Black Sandshell Mussels. Risks and minimization measures are similar to those for the Slippershell Mussel.

Northern Brook Lamprey, *Ichthyomyzon fossor*

Another endangered aquatic species, the Northern Brook Lamprey, may also be present. All records for this species in Illinois, save one, are in the Kankakee River basin, which includes the Iroquois River.

The life cycle of this small (4-5 inches) non-parasitic lamprey is such that standard fish surveying methods seldom collect it. Only a specialized survey has a reasonable prospect of ascertaining the presence of this lamprey. The majority of its life cycle, four-to-five years, is spent as a larva (ammocoete) buried in the sediment and vegetative detritus of the stream bed, so it is not taken by methods commonly used to survey free-swimming fishes (seining; electro-shocking, etc.). Because the larvae of lamprey species are very similar, even specialists may have difficulty correctly identifying them (the non-listed American Brook Lamprey, *Lampetra appendix*, also occurs in these basins).

Its transformation to a free-swimming adult occurs in the Fall. Because adults do not eat, they are not taken by sport fishermen. It spawns in gravel riffles during February or early March, dying immediately afterward. Its adult life-stage occurs when very few people work near or recreate in rivers and streams, so it is seldom directly observed. Consequently, any permanently-wetted stream bed with appropriate substrate may support undetected lamprey larvae.

Wind farm construction may disrupt Lamprey habitat through increased siltation and sedimentation, through water pollution resulting from possible spills of fuel or other construction-related chemicals, and through disruption of field tile flows. If streams or drainage ditches are proposed to be altered, potential direct impact to the species or its habitat could occur.

Upland Sandpiper, *Bartramia longicauda*

This State-listed threatened grassland bird prefers habitat of short-grass prairie/pasture. For many years this ground-nesting species was thought to be area sensitive, requiring ten acres or more of grassland habitat for successful breeding. However, many recent breeding efforts are occurring in grassed waterways of row-crop fields, which provide considerably less than ten acres of habitat, and from along roadsides.

While no breeding records are known from Iroquois County, they exist for surrounding Counties, and this species undoubtedly appears as a migrant in Iroquois County.

The Upland Sandpiper engages in an aerial courtship display which passes through the rotor-swept elevations of utility-scale wind turbines, placing it at risk of collision mortality. Whether this species will be sensitive to the proximity of vertical structures, or to shadow "flicker" on potential nesting areas, has not been demonstrated.

The Department recommends mapping all habitat types within the project footprint, and checking even relatively small areas of appropriate habitats for the presence of this species prior to any initiation of construction disturbance during the breeding season.

Henslow's Sparrow, *Ammodramus henslowii*

A State-listed threatened species scheduled for de-listing, the Henslow's Sparrow is area-sensitive to fragmented habitat, roads, trails, and vertical structures. The Henslow's Sparrow will not establish breeding territories within 100 feet of any "edge" feature, whether a plowed field, fence-row, road, or trail.

The construction phase of a wind energy facility near suitable habitat poses the risks of disrupting established nesting territories or of excluding the species from available habitat through either displacement or habitat fragmentation. The permanent presence of turbines and service roads may continue this exclusion. Potential risk during migration should also be considered.

Loggerhead Shrike, *Lanius ludovicianus*

The threatened Loggerhead Shrike is adapted to the savanna conditions of interspersed grasslands, shrubs, and trees. This species has been adversely affected by the decline in animal husbandry and the abandonment of the "shelter-belt" fence-row conservation practice, which has severely reduced both breeding and foraging habitat. The Shrike, also known as the "butcher bird," needs thorny trees and shrubs, even barbed wire, on

which to impale its prey, which may be left for several days before being eaten. Areas which support large insects and small rodents, major food items, are also necessary. Due to losses of suitable habitat, Loggerhead Shrikes may attempt reproduction in trees near human habitations and in other areas where they would normally not be expected. The Shrike has not been reported as breeding in Iroquois County since its listing.

The primary consideration for wind energy facilities is the potential for further loss of remaining habitat, if fence-rows are cleared to avoid wind turbulence or to improve turbine exposure, or if road-side trees are cleared to create turning radii for turbine carriers or to establish power lines. A pre-construction survey to identify the presence of Shrike nests should be conducted for areas with suitable habitat if work is proposed during the breeding season in order to avoid direct mortality. "Resident" foraging birds are not thought to be at significant risk from operating wind turbines, but potential risk associated with migrants should be considered.

Short-Eared Owl, *Asio flammeus*.

The endangered Short-Eared Owl also nests and winters in grasslands and wetlands. Iroquois County lies in both breeding and wintering ranges, although breeding Short-Eared Owls have not been reported in Iroquois County. However, large numbers of wintering owls have been observed in suitable winter habitat.

Highly nomadic, the Short-Eared owl depends heavily on vole and mouse populations, and the size of its breeding and hunting territories varies inversely with prey population sizes. When prey populations are high, owls may be ground-roosting every few meters in suitable habitat. The Northern Harrier often harasses this Owl, stealing its food.

This Owl's hunting flights are often less than ten feet off the ground (a circumstance which makes this bird highly vulnerable to collisions with vehicles); during aerial mating rituals, flights occur at typical wind turbine rotor-swept height. This Owl is highly dependent on its acute hearing to locate and seize prey. The degree to which noise from wind turbines may interfere with predation behavior is unknown.

The effects of wind turbines on Short-Eared Owls may be heavily influenced by the proximity of turbines to breeding, roosting, and hunting areas. Once turbines are built, this proximity relationship will be subject to change as land owners alter land management practices. This is likely to be of concern mainly if attractive habitat for Owls and their prey is created within or near the turbine array following construction.

Migratory Birds

Whooping Crane, *Grus americana*.

An experimental population of the federally-listed endangered Whooping Crane has been established with breeding grounds in Wisconsin and wintering areas in Florida. Fall and Spring migrations carry this species through Illinois.

Whooping Cranes may "stop over" in Illinois, and in Iroquois County, for extended periods. In November 2006, two groups of Whooping Cranes, on separate occasions, spent several days west of Chebanse. A Whooping Crane spent two months near Beaverville in 2003, and another loitered near Danville, Vermilion County, until the end of June 2008. And during the Fall 2008 migration, 22 Whooping Cranes "stopped-over" in Livingston County.

During such stop-overs, cranes often forage on waste corn in agricultural fields. Wind turbines and associated power lines pose a collision risk for these large birds, which require some distance to achieve safe altitudes. Most non-predation losses to this flock have been to power line collisions. In Fall 2008, during a migration flight, one of the young birds following the ultra-light aircraft refused to fly over a wind farm in McLean County, at an altitude of 2,500 feet, suggesting that at least some birds may shy away from wind turbine arrays.

Due to the very high public profile of the Whooping Crane, the Department suggests the developer/operator of this particular facility coordinate at least annually with the Whooping Crane Eastern Partnership (www.bringbackthecranes.org) to track the passage of Whooping Cranes through the vicinity, and explore additional measures to reduce potential losses of these birds.

American Golden Plover, *Pluvialis dominica*.

This migratory bird breeds in the Arctic tundra, migrates south along the Atlantic seaboard to South America in the winter, but returns northward through central North America. Areas of Illinois and Indiana provide important spring migration staging areas, which may be occupied by this species for a month or more while birds go through a molt before resuming migration. It has become a species of concern due to its relatively low global population estimate of around 300,000 birds.

Based on 25 years of Spring Bird Count data, it is likely that significant numbers of this species congregate in Iroquois County, within or adjacent to the project footprint. Because large operating wind energy facilities already exist in Benton County, IN, up to the State line, it is possible Plovers which usually stage in Indiana may be displaced into Iroquois County. Pre- and post-construction surveys should be performed to observe this species.

Plovers tend to aggregate in dense concentrations, and are known to fly in large tight groups through the approximate rotor-swept elevation, which may expose them to collision mortality risk. Concerns also exist pertaining to habitat fragmentation by service roads, and displacement from habitat due to potential sensitivity to vertical structures and human activity.

A research project has begun in an effort to better understand the behavior and needs of this species, as well as how it may be affected by the presence of wind turbines. Some preliminary results were recently published [O'Neal, *et. al.* (2008)].

A number of observers had reported a daytime habitat preference for short grass, soybean stubble, or bare ground with standing water or residual moisture, but O'Neal first reported a night roost preference for standing corn stubble cover, with crepuscular movement between the two. O'Neal reported all observations were located more than 70 meters from adjacent roads, suggesting intolerance for breaks in habitat. (Effects of traffic were not investigated.) Interestingly, O'Neal also reported several observations of predation of the Golden Plover by the Northern Harrier.

Bats

Chiropteran use and mortality studies performed at active and proposed wind turbine locations in Illinois suggest that bats are at greater risk from wind turbines than birds. Bats are present and active, even over areas which are 90% or more cropland. Because bats have longer life-spans and lower reproductive rates than birds, impacts of wind turbines on bats may prove to be of greater conservation concern than impacts to most birds. In the only study of mortality completed at an Illinois wind power facility, the bat mortality rate was nearly three times that for birds.

The nearest federally-designated Critical Habitat for the endangered Indiana Bat, *Myotis sodalis*, is the Blackball Mine hibernaculum near LaSalle-Peru. The Department possesses no capture records for this species in Iroquois County, the nearest being a summer record in extreme southern Ford County. This species disperses widely from its hibernacula, traveling up to 300 miles to summer habitat, raising the possibility that this species migrates through Iroquois County.

To date, the death of an Indiana Bat has not been documented at any wind turbine site in the United States. Therefore the Department rates the potential for an incidental take of an Indiana Bat at this facility as low, but cannot rule it out. More common bat species undoubtedly occupy habitats in the vicinity, and are probably at risk of mortality, directly through collisions with wind turbines, or indirectly through baro-trauma (lung hemorrhages caused by extremely low air pressures in the vortices created by wind turbine vanes).

It is recommended that an Anabat detector survey be conducted, particularly during the fall bat migratory season (August 1 through October 31) when activity would be expected to be the highest, in order to characterize bat activity in the project area. High frequency bat signals could indicate the presence of the Indiana Bat in the vicinity; with limited high frequency signals, risk to this species could be inferred to be low.